

What is claimed is:

- 1 1. A method of forming a dielectric, comprising:
 2 forming a fluorine containing film on a substrate; and
 3 placing the substrate into a reaction chamber and exposing the fluorine
 4 containing film to a reducing plasma.
- 1 2. The method Claim 1, wherein the substrate is a silicon wafer, and the
 2 fluorine containing film is a substantially planar insulating layer.
- 1 3. The method of Claim 1, wherein the fluorine containing film has exposed
 2 sidewalls.
- 1 4. The method of Claim 3, wherein the fluorine containing film has a covered top surface.
- 1 5. The method of Claim 1, wherein the plasma is formed from a hydrogen
 2 bearing precursor gas and a carrier gas.
- 1 6. The method of Claim 5, wherein the hydrogen bearing precursor
 2 comprises NH_3 gas.
- 1 7. The method of Claim 6, wherein the carrier gas comprises a gas selected
 2 from the group consisting of N_2 , Ar and He.

SUB A2 1 8. The method of Claim 7, wherein the fluorine containing film comprises a
2 material selected from the group consisting a-C:F, parylene AF4, carbon-doped
3 SiOF, fluorinated organic polymers, fluorinated siloxane polymers, and SiOF.

Sub C1 1 9. The method of Claim 1, wherein the fluorine containing film comprises
2 parylene-AF4.

SUB A3 1 10. A method of forming an interlayer dielectric in an integrated circuit,
2 comprising:
3 depositing a fluorinated material on a substrate;
4 forming via openings in the fluorinated material; and
5 exposing the fluorinated material to a hydrogen containing plasma.

1 11. The method of Claim 10, wherein the fluorinated material comprises
2 SiOF.

Sub C1 1 12. The method of Claim 11, further comprising depositing a conductive
2 material in the via openings.

SUB A4 1 13. The method of Claim 10, wherein the fluorinated material comprises
2 parylene-AF4.

Sub C1 1 14. The method of Claim 13, further comprising depositing a hardmask layer
2 over the parylene-AF4 prior to forming the via openings.

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1 15. The method of Claim 14, wherein depositing the hardmask comprises
2 forming a layer of silicon nitride over the fluorinated material.

1 16. The method of Claim 10, wherein the plasma is formed in a reaction
2 chamber from ammonia and argon at a pressure between 1 mTorr and 50 Torr
3 and an RF power of between 100 watts and 500 watts.

1 17. The method of Claim 16, wherein the ammonia is passed into the reaction
2 chamber at a flow rate in the range of 10 sccm to 3 liters/minute.

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1 18. An interconnect structure, comprising:
2 a patterned layer of fluorinated dielectric material disposed on a substrate,
3 the patterned layer having a top surface and via openings therein, the via
4 openings defining sidewalls;
5 a first material disposed on the top surface of the fluorinated dielectric
6 material; and
7 a second material disposed on the sidewalls;
8 wherein the fluorinated dielectric material comprises an interior portion
9 having a first fluorine concentration, and a surface portion having a second
10 fluorine concentration, and the first fluorine concentration is higher than the
11 second fluorine concentration.

1 19. The interconnect structure of Claim 18, wherein the first material
2 comprises an SiOF.

1 20. The interconnect structure of Claim 18, wherein the second material
2 comprises a conductive material.

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